



# UNITED STATES PATENT AND TRADEMARK OFFICE

187

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,576	07/07/2003	Cheng-Lung Shih	250809-1030	7459

24504 7590 02/10/2005

THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP  
100 GALLERIA PARKWAY, NW  
STE 1750  
ATLANTA, GA 30339-5948

EXAMINER

HOGAN, JAMES SEAN

ART UNIT PAPER NUMBER

3752

DATE MAILED: 02/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/614,576	<b>Applicant(s)</b> SHIH ET AL.	
	<b>Examiner</b> James S Hogan	<b>Art Unit</b> 3752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 July 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6 rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admission of prior art shown in Figures 1A and 1B of the application.
3. Regarding the apparatus claims 1-6, the prior art supplied by the applicant teaches a shower head used in a dry etching tool to spray a gas having an aluminum base (102); and a ceramic nozzle plate (104) embedded in the aluminum base, and the ceramic nozzle plate having a plurality of gas holes (110) to spray the gas. As per claim 2 and 3, the aluminum base and ceramic nozzle plate are cross-shaped. As per claim 5, the ceramic nozzle plate is embedded in the front side of the aluminum base while the rear side of the aluminum base corresponding to the ceramic nozzle plate is hollowed. As per claim 4, the prior art admission does not disclose the purity of the ceramics used in the invention, it would have been obvious to one skilled in the art at the time the invention was made to have regarded the purity of the ceramics used in a dry-etching nozzle in order to prolong the longevity of the nozzle plate.

Claims 7-12 rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admission of prior art shown in Figures 1A and 1B of the application and in view of Japanese Patent JP 40923999 A to Aoki.

Regarding the apparatus claims 7-9, the prior art supplied by the applicant teaches a shower head used in a dry etching tool to spray a gas, having a cross-shaped aluminum base; and a nozzle plate embedded in the aluminum base. The nozzle plate, which is cross-shaped, has a plurality of gas holes to spray the gas. As for claims 11 and 12, the nozzle plate is embedded at the central part of the aluminum base, the base having a front side and a rear side. The nozzle plate is embedded in the front side of the aluminum base while the rear side of the aluminum base corresponding to the nozzle plate is hollowed. However, as for claim 10, the prior art of the application does not teach the nozzle plate made of an engineering polymer, specifically of a polyimide resin. The invention of Aoki teaches a nozzle plate composed of a polyimide resin in the translated abstract. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have manufactured a nozzle plate of polyimide resin in order to have a viable, less expensive alternative to ceramics.

Claims 13-20 rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admission of prior art shown in Figures 1A and 1B of the application and in view of U.S. Patent No. 5,916,720 to Springett.

The limitations on the apparatus as described in the method claims 13, and 15-20 are outlined in the rejections above. The prior art does not teach a method of coating an Al<sub>2</sub>O<sub>3</sub> film on the aluminum base. Springett ('720) teaches a method for

Art Unit: 3752

manufacturing an imaging member outlined as coating an Al<sub>2</sub>O<sub>3</sub> film on the surface of an aluminum substrate by electrodepositing an oxalic acid solution (Col. 3, line 65-Col 4, line 62). As for claim 14, the method can produce a thickness of the Al<sub>2</sub>O<sub>3</sub> film in excess of 25-35  $\mu$ m. Therefore it would have been obvious to one skilled in the art at the time the invention was made to have employed the plating technique of Springett in order to create an Al<sub>2</sub>O<sub>3</sub> layer on an aluminum substrate that can endure a longer existence in a dry-etching process.

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure is as follows.

U.S. Patent Publication US 2002/0056698 A1 to Makigaki et al., disclosing an ejection device

U.S. Patent Publication US 2002/0015081 A1 to Okazaki et al., disclosing an ink jet recording head.

IBM Disclosure Document NB9206453, disclosing fabrication of ink jet printer head components through mask electrochemical micromachining.

U.S. Patent No. 6,527,368 to Giri et al., disclosing a layer with discontinuity over fluid shot

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S Hogan whose telephone number is (571) 272-4902. The examiner can normally be reached on Mon-Fri, 7:00a-4:00p EST.

Art Unit: 3752

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Scherbel can be reached on (571) 272-4919. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JSH  
02/05/2005



**David A. Scherbel**  
**Supervisory Patent Examiner**  
**Group 3700**